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Federal Emergency Management Agency
Office of Inspector General
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Audit of the National Fire Incident Reporting System (Version 5.0)



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Federal Emergency Management Agency

Office of Inspector General
Washington, D.C. 20472

February 26, 2003

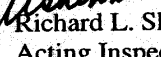
MEMORANDUM FOR:

R. David Paulison
Administrator
United States Fire Administration

Rosita O. Parkes
Assistant Director/Chief Information Officer
Information Technology Services Directorate

Patricia A. English
Senior Procurement Executive
Financial and Acquisition Management Division

FROM:


Richard L. Skinner
Acting Inspector General

SUBJECT:

*Audit of the National Fire Incident
Reporting System (Version 5.0)*
Report No. H-05-03

Attached are the results of our audit of the National Fire Incident Reporting System (Version 5.0). The objective of the audit was to determine whether FEMA acquired, developed, and maintained the National Fire Incident Reporting System Version 5.0 (NFIRS 5.0) in a controlled manner and according to relevant federal guidelines. The independent accounting firm, KPMG LLP, at our direction and with our assistance, performed the audit.

The report addresses weak contracting arrangements and system development problems that have left FEMA open to criticism, and system control weaknesses that increased FEMA's risk of system processing problems and security breaches. FEMA has begun to correct some of these issues.

Pursuant to FEMA Instruction 1270.1, please advise this office by April 28, 2003, of the actions taken to implement our recommendations. Should you have questions, please contact Sue Schwendiman, Chief, Financial Management Branch, at (202) 646-3315.

FEDERAL EMERGENCY MANAGEMENT AGENCY

Audit of the National Fire Incident Reporting System (Version 5.0)

February 25, 2003

**Prepared for the
FEMA Office of Inspector General**

by



Audit of the National Fire Incident and Reporting System (Version 5.0)

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EXECUTIVE SUMMARY

The National Fire Incident Reporting System (NFIRS) is the system used by the United States Fire Administration (USFA) to collect and maintain national fire incident data. USFA gathers this data under the authority of the Federal Fire Prevention and Control Act of 1974 (the Act), which requires USFA to analyze and disseminate information regarding the prevention and control of fires. The Act also authorizes USFA to encourage and assist state and local fire agencies to report fire incident data. USFA uses NFIRS 5.0, the most current version of the system, to accomplish these objectives. USFA is a part of the Federal Emergency Management Agency (FEMA), and is assisted by other FEMA organizations, most notably the Financial Acquisition Management Division (FAMD) and Information Technology Services Directorate (ITSD), in obtaining NFIRS 5.0 development and maintenance services and in managing the technology infrastructure supporting NFIRS 5.0.

The purpose of this audit was to determine whether FEMA has acquired, developed, and maintained NFIRS 5.0 in a controlled manner and in accordance with relevant Federal guidance. Before and during our review, FEMA took several positive actions regarding NFIRS 5.0, including the completion of two independent system reviews during FY 2001. Despite these positive efforts, we also found that FEMA can make further improvements with NFIRS 5.0 processes and controls. Specifically, weak contracting arrangements and system development problems have left USFA open to criticism, and system control weaknesses that existed at the time of our audit increased FEMA's risk of system processing problems and security breaches. FEMA has addressed some of these problems, but efforts are not yet complete.

The FEMA Office of Inspector General (OIG) contracted with KPMG LLP to assist in performing the audit. The OIG initiated the audit after a request for assistance from USFA in early 2001. Our report recommends that USFA, ITSD, and FAMD coordinate to reconsider the NFIRS 5.0 acquisition strategy in such a manner to ensure sufficient consideration of contractor competition and the most economical and effective acquisition of services; USFA and ITSD document NFIRS 5.0 investment analyses as required by Office of Management and Budget guidance; and USFA and ITSD continue to improve identified general system control weaknesses.

INTRODUCTION

Background

The National Fire Incident Reporting System (NFIRS) is the system used by the United States Fire Administration (USFA) to collect and maintain national fire incident data. USFA gathers this data under the authority of the Federal Fire Prevention and Control Act of 1974 (the Act), which requires USFA to analyze and disseminate information regarding the prevention and control of fires. The Act also specifically authorizes USFA to encourage and assist state and local fire agencies to report fire incident data. USFA uses NFIRS 5.0, the most current version of the system, to accomplish these objectives. USFA is a part of the Federal Emergency Management Agency (FEMA), and is assisted by other FEMA organizations, most notably the Financial Acquisition Management Division (FAMD) and Information Technology Services Directorate (ITSD), in obtaining NFIRS 5.0 development and maintenance services and in managing the technology infrastructure supporting NFIRS 5.0.

NFIRS 5.0 Description

NFIRS 5.0 is a combination of web, application, and database software that facilitates the collection and processing of fire incident data and storage of the data in USFA's National Fire Database. Fire agencies send their data to the National Fire Database over the Internet either by obtaining their own software that meets NFIRS 5.0 standards or by using free software from USFA, called the Data Entry Tool (DET). The most common reporting process begins with local fire agencies entering their fire incident data into a NFIRS 5.0 compatible software package (i.e., DET, vendor system, or internally developed system). Local agencies then send the data to their state fire agency, which transmits the data to the National Fire Database. Some larger fire departments transmit their data directly. USFA also provides free data validation software to state and local agencies to help ensure that submitted data is in compliance with NFIRS 5.0 standards. When USFA receives the data, it uses this software again to perform a compliance check.

USFA reported that by using NFIRS 5.0, it collects and processes data from 42 states and over 14,000 fire departments for more than 900,000 fire incidents each year. Still, USFA estimated that only 44 percent of all fires to which fire departments respond are reported to it. Since reporting fire data is voluntary, USFA believes that the free DET and data validation software encourage the participation of state and local agencies.

NFIRS 5.0 Development

Planning for NFIRS 5.0 began in 1989, but the system was not deployed until 10 years later, in 1999. The planning stage, which included developing user requirements, was a lengthy process. It was not until 1994 that USFA engaged a contractor to begin development of NFIRS 5.0. After initial development efforts, USFA officials said they experienced problems with the contractor's performance and let the contract expire. USFA officials reported that by 1996, software vendors and user communities were exerting significant pressure to deploy NFIRS 5.0. Vendors in particular wanted the NFIRS 5.0 system specifications so they could develop compatible software products. To expedite final development, USFA hired a new development contractor

under an existing FEMA telecommunication services contract rather than initiating a new procurement. The telecommunications contractor then subcontracted the NFIRS 5.0 development work to a systems development vendor, generating criticism that FEMA's NFIRS 5.0 acquisition practices circumvented vendor competition. According to senior FAMD procurement officials, FEMA's contract with the telecommunications vendor lapsed, and its re-competition has been delayed because FEMA's fiscal year 2003 appropriation was delayed. Senior FAMD and USFA officials have indicated their desire to move NFIRS 5.0 development and maintenance activities away from the telecommunications contract.

Since 1996 USFA has expended \$4.5 million on NFIRS 5.0 development and maintenance. Further planned expenditures for continued enhancement and maintenance services, as reported to the Office of Management and Budget (OMB)¹, are as follows: \$900,000 for fiscal year (FY) 2003, \$1.1 million for FY 2004, and \$600,000 for FY 2005.

Objective, Scope, and Methodology

The purpose of this audit was to determine whether FEMA has acquired, developed, and maintained NFIRS 5.0 in a controlled manner and in accordance with relevant Federal guidance. The FEMA Office of Inspector General (OIG) contracted with KPMG LLP to assist in performing the audit. The OIG initiated the audit after a request for assistance from USFA in early 2001.

The scope of the audit included NFIRS 5.0 development, enhancement, and maintenance activities from 1994 to present. The audit was performed at FEMA headquarters and USFA offices in Emmitsburg, Maryland. To complete this audit, we:

- Interviewed USFA and other FEMA personnel and reviewed NFIRS 5.0 related documentation to obtain an understanding of the NFIRS 5.0 system, business rules, controls, and processing environment.
- Reviewed documentation relevant to NFIRS 5.0 acquisition, development, enhancement, and functionality, including (1) minutes of meetings conducted between USFA officials, NFIRS 5.0 users, and personnel from fire incident reporting software vendors; (2) customer service calls regarding NFIRS 5.0 operations; and (3) news articles related to NFIRS 5.0.
- Conducted interviews with a small judgmental sample of fire community personnel, including personnel from fire departments and fire incident reporting software vendors.

We began fieldwork for this audit in September 2001 and completed it in November 2002. We provided a draft of this report to senior officials in USFA, ITSD, and FAMD in December 2002 and received responses through February 2003. Those comments are described later in this report in the section "Management Comments and Our Analysis." This audit was conducted according to generally accepted government auditing standards.

¹ FEMA reports budget information for IT investments annually on OMB's Exhibit 300, *Capital Asset Plan and Justification*.

RESULTS OF THE AUDIT

FEMA took several positive actions before and during our audit regarding NFIRS 5.0, including the completion of two independent system reviews during FY 2001. FEMA, however, could make further improvements in its acquisition, development, and maintenance practices for NFIRS 5.0. Specifically, weak contracting arrangements and system development problems have left USFA open to criticism, and system control weaknesses that existed at the time of our audit increased FEMA's risk of system processing problems and security breaches. FEMA has addressed some of these problems, but efforts are not yet complete.

Acquisition of NFIRS 5.0 Services

Since 1996 FEMA has obtained development, enhancement, and maintenance services for NFIRS 5.0 and other information systems under a broad FEMA-wide Indefinite Delivery, Indefinite Quantity (IDIQ) telecommunication services contract administered by ITSD. Once awarded, an IDIQ contract allows FEMA to acquire services under the contract without soliciting bids from other firms. Federal Acquisition Regulations (FAR) Part 16.505, *Ordering - Indefinite quantity contracts*, however, still requires that IDIQ orders be within the contract scope. The scope of this FEMA-wide IDIQ contract is clearly defined as telecommunications support, as the following contract excerpt illustrates:

“The scope of this contract requires the Contractor work with FEMA to define, develop, study, analyze, plan, evaluate, provision, order, establish, integrate, test, operate, maintain repair, modify, move, remove, disconnect, and in any other way support FEMA's telecommunications requirements.”

The scope of the telecommunications contract is further illustrated by example contract deliverables, which include satellite and wireless network services. While NFIRS 5.0 depends upon telecommunications to transmit data, we consider the development of application software and the DET – unless tightly integrated with a telecommunications system – to be general system software development rather than telecommunications support. The telecommunications contract does have a general system development clause, which USFA, ITSD, and FAMD officials stated covers the NFIRS 5.0 work. We consider its use, however, to acquire NFIRS 5.0 development, enhancement, and maintenance services, under what is essentially a telecommunications support contract, as overly broad.

The use of this IDIQ contract has led to complaints that FEMA has not provided fair competition for NFIRS 5.0 services. ITSD officials countered this criticism by stating that the original telecommunications contract was competed. This interpretation of the contract, however, has left FEMA open to criticism, especially now that there are more comparable options available from the vendor community. In addition, the IDIQ contract might not be the most effective and economical vehicle to obtain maintenance services. Since the contract is primarily for telecommunication services, non-telecommunications companies capable of software development and maintenance services would have been at a competitive disadvantage during the initial procurement. Once the IDIQ contract was awarded, FEMA did not have to further compete tasks it determined to be under the contract.

The telecommunications support contract expired on September 30, 2002, and as of December 2002, according to FEMA's senior procurement official, its re-competition has been delayed because FEMA's fiscal year 2003 appropriation had not been approved. In December 2002, subsequent to our fieldwork, FEMA awarded a "bridge" contract; however, a delivery order specific to NFIRS operations and maintenance services had not been issued. A delivery order was necessary to complete the contracting process. Consequently, from October 2002 to the award of the "bridge" contract, the contractor worked without any contract document in place.

Recommendation

1. We recommend that the Administrator, USFA, Assistant Director/Chief Information Officer (CIO), ITSD, and FEMA's Senior Procurement Executive, FAMD, coordinate to reconsider the acquisition strategy for NFIRS 5.0 development, enhancement, and maintenance services to ensure contractor competition has been sufficiently considered and USFA is acquiring services in the most economical and effective manner. Appropriate contracting actions should be taken as quickly as possible to ensure that all necessary contracting documentation is in place.

Development, Enhancement, and Maintenance Decisions for NFIRS 5.0

The Clinger-Cohen Act of 1996 and Office of Management and Budget (OMB) Circular A-130, *Management of Federal Information Resources*, require that agencies justify their IT projects through an analysis of investment alternatives, a benefit cost analysis (BCA), and a return on investment (ROI) analysis. Although development of NFIRS 5.0 started before 1996 when the Clinger-Cohen Act was passed, USFA has spent \$4.5 million on NFIRS 5.0 since then. USFA provided us some documented analyses; however, the analyses did not meet OMB Circular A-130 requirements. Furthermore, OMB Circular A-130 requires that agencies prepare BCAs throughout a system life cycle, and FEMA does not have a documented analysis for NFIRS' current life-cycle phase.

Complete and well-documented IT investment analyses would have been particularly useful to USFA in demonstrating the claimed merits of its decision to develop and continue enhancing the DET. Private sector software developers criticized USFA for developing and distributing DET at no charge, which they considered to be a competing product. According to USFA officials, no software existed in 1996 to meet USFA's local, state, and Federal functionality requirements, and full-function state level software was not available from vendors until after 2001. FEMA officials further said that USFA had not initially planned to provide free software, but did so at the request of its constituents. Distribution of the software at no cost was also one way to encourage participation in FEMA's voluntary data collection program.

Once NFIRS 5.0 standards were established, however, many comparable vendor data entry systems based on that standard were deployed. OMB Circular A-130 states that an agency should only develop new information systems or improve them "when no alternative private sector or governmental source can efficiently meet the need." OMB Circular A-130 also guides that an agency should redesign work processes to make maximum use of commercial off-the-

shelf (COTS) software. With many vendors now offering products with comparable DET functionality, an IT capital planning analysis might show that it is in FEMA's best interest to transfer components of NFIRS 5.0 functionality to the vendor community, given the cost of maintaining and enhancing software during its life cycle. Such a transfer appears to be in the USFA's plans for NFIRS 5.0. The statement of work for FY 2002 contractual support services identified the goal of transitioning certain NFIRS 5.0 functionality to the fire software vendor community. The timeframe for this transition, however, was not specified, and the decision was not documented in an alternatives analysis, BCA, or ROI.

The lack of a sound and well documented NFIRS 5.0 IT capital planning process is probably due, at least in part, to deficiencies in FEMA's overall IT capital planning program. In our FY 2002 report entitled *Audit of FEMA's Information Technology Capital Planning and Investment Control Process*, we identified several other major FEMA systems that did not have the required analyses. FEMA management recognized these deficiencies, and in January 2002 the Director formally recommitted the agency to having an effective IT capital planning process. Agency-wide initiatives are being planned to address the risks.

Recommendation

2. We recommend that the Administrator, USFA, and the Assistant Director/CIO, ITSD, ensure that an NFIRS 5.0 analysis of alternatives, BCA, and ROI are documented and consistent with OMB requirements. This is especially important in light of the recently increased options in the fire software marketplace.

Development Delays and User Concerns

As mentioned earlier, the NFIRS 5.0 development process was lengthy and problematic, and as a result, USFA received criticism in the media and from software vendors. Progress on NFIRS 5.0 from 1994 to 1996 did not meet USFA expectations. USFA officials stated that USFA received some contract deliverables, such as system specifications and a Quick Reference Guide, but did not receive the critical software design documentation.

FEMA hired a new contractor and deployed the system in 1999. After deployment, however, there were still problems, which caused frustration on the part of vendors and users. For example, during 1999 USFA released system enhancements and incident code changes several times per year with no set schedule and with little public notice. Vendors found it difficult to develop software compatible with the changing NFIRS 5.0 standards, and users found it difficult to keep up with unexpected NFIRS 5.0 releases. To address this issue, USFA implemented a semi-annual change release schedule in 2000, with plans to implement an annual release schedule later in 2003. NFIRS 5.0 changes are now announced in advance to the vendor and user communities via the NFIRS website and through periodic meetings between USFA and the user community.

After the difficult development and deployment period, general system functionality now appears adequate based on a high level review. Specifically, we reviewed change logs and user questions addressed by USFA's customer service function. They indicate that operations have

been running fairly smoothly. We also conducted interviews with a small judgmental sample of users and vendors and again received generally positive comments about the current state of the system. USFA has also been proactive by coordinating two recent independent NFIRS 5.0 post implementation reviews to help assess system strengths and weaknesses.

General Systems Controls Need Improvement

The Clinger-Cohen Act and OMB Circular A-130 require that agencies implement adequate information systems controls. During our review, FEMA took several positive actions to address general system control weaknesses identified during an FY 2001 NFIRS 5.0 security audit and an FY 2001 Independent Verification and Validation (IV&V). Both of these efforts preceded our audit and were initiated by FEMA. Despite these positive efforts, we found that FEMA could make further improvements in the areas of segregation of duties, security authorization, change control, and contingency planning. We have issued a report today for limited official use only, which describes in more detail computer security weaknesses identified and offers specific recommendations for correcting each.

MANAGEMENT COMMENTS AND OUR ANALYSIS

The senior USFA official responsible for NFIRS 5.0 and FEMA's Senior Procurement Executive provided us informal comments in response to a draft of this report. The senior USFA official stated that USFA's request for assistance from the OIG in conducting an independent audit was intended to be the start of a formal review and documentation of alternatives. The official also requested that we credit USFA for actions it has taken on its own initiative to improve NFIRS 5.0 and related processes. In particular, the official noted that prior to our audit two system reviews had made USFA aware of the general system control weaknesses. We changed the report to address these concerns when deemed appropriate.

The Senior Procurement Executive agreed with the draft report's findings and recommendations pertaining to the acquisition of NFIRS 5.0 and related services.

We received formal written comments on a draft of this report from ITSD, which are presented in Appendix A. ITSD generally agreed with our findings and recommendations but requested that we more clearly identify the responsible action office for certain recommendations. We made changes as deemed appropriate.

Appendix A: ITSD Comments on Draft Report



Federal Emergency Management Agency

Washington, D.C. 20472

FEB 13 2003

MEMORANDUM FOR:

Nancy L. Hendricks
Assistant Inspector General for Audits

FROM:

FOR
Rosita O. Parkes
Chief Information Officer and
Assistant Director
Information Technology Services Directorate

SUBJECT:

Draft Report – Audit of the National Fire Incident
Reporting System Version 5.0 (NFIRS v. 5.0)

ITSD appreciates the opportunity to comment on the subject report. Our response to the six recommendations in that draft report follows:

ITSD has reviewed recommendations one and two of the NFIRS audit. We concur with both of these recommendations.

ITSD agrees in principle with recommendations three, four, and five. Each is consistent with a previously-known condition. The recommendations appear to be primarily the responsibility of the NFIRS' Program Official. Consequently, we recommend that the associated wording on page 10 be changed to the following: "We recommend that the Administrator, USFA, in consultation with the Assistant Director ITSD/CIO, ensure that:...". This change would remove any ambiguity regarding the responsible action office.

ITSD agrees with recommendation six and will work with the appropriate program staff to set up a formal change management process for NFIRS.

Should you or your staff have any questions, please call me or Ed Kernan, Information Resources Management Division Director, at x2986.



Federal Emergency Management Agency

Office of Inspector General
Washington, D.C. 20472

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IG Report No.: H-05-03

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3. What format, stylistic, or organizational changes might have made this report's overall message clearer to the reader?
4. What additional actions by the Office of Inspector General on the issues discussed in this report would have been helpful?
5. Additional comments to improve future reports.

Please include your name and telephone number so that we may contact you should we have questions about your comments.

Name: _____

Date: _____

Organization: _____

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Please send your comments and questions to the following address or fax them to (202) 646-3901. You may also cemail/email your comments to James Daniels@FEMA.Gov, or call Mr. Daniels at (202) 646-3221.

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